PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
A02-40081/Ba/kdu		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/NL 02/00594	17.09.2002	22.01.2002
International Patent Classification (IPC) or both national classification and IPC		
A23J3/08		
Applicant		
CAMPINA B.V. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 5 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24.04.2003	01.04.2004
Name and mailing address of the international preliminary examining authority:	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Heirbaut, M Telephone No. +49 89 2399-8642

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NL 02/00594

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-18 as originally filed

Claims, Numbers

1-24 received on 17.10.2003 with letter of 17.10.2003

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☒ the claims, Nos.: 25

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	
	No:	Claims	1-24
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-24
Industrial applicability (IA)	Yes:	Claims	1-24
	No:	Claims	

2. Citations and explanations

see separate sheet

V

1 Reference is made to the following documents (D) cited in the international search report:

D5: WO 96 13177 A
D7: US-A-4 423 083

2 The subject-matter of present independent claim 1 (method) does not meet the requirements of novelty (Article 33(2) PCT) in the light of the prior art document D5, which teaches the combination of features indicated in said claim.

Document D5 teaches a method of preparation of a gelled protein-based product, comprising mixing gellan gum (being a hydrocolloid which precipitates with metal cations; see page 4 paragraph 3 of the present application) with water, cooling the solution and adding milk solids, dissolving calcium salt in water and adding this solution to the mixture, forming a gel and cutting pieces (see in particular claim 8 in D5). Typical sequestrants employed to form the gels are inorganic phosphates, eg sodium hexametaphosphate, tetrasodium pyrophosphate, disodium orthophosphate and sodium tripolyphosphate, as well as EDTA (see in particular page 5 last paragraph in D5). Milk solids employed are eg skimmed, instant, reconstituted and modified milk powder (see in particular page 5 paragraph 2 in D5).

3 The subject-matter of present independent claims 22-24 (product) does not meet the requirements of novelty (Article 33(2) PCT) in the light of any of the prior art documents D5 or D7, which teach the combination of features indicated in said claims.

Reference is made to paragraph 2 of this official communication for a discussion of prior art document D5.

Furthermore, it is stressed that:

(1) Document D7 teaches a process for the preparation of products with meat-like fibrous textures, in which heat coagulable proteins are mixed with alginate (being a hydrocolloid which precipitates with metal cations; see page 4 paragraph 3 of the present application) , cooled, sliced, gelled, heated, treated with a sequestering agent and isolated (see in particular claim 1 in D7). Preferred gelling agents are calcium salts (see in particular claim 7 in D7). Preferred sequestering agents are phosphates (see in particular claim 9 in D7). A product is not rendered novel merely by the fact that it is produced by a different process than the processes disclosed in the prior art, if said process does not confer any distinctive technical features to said product.

(2) A claim for a composition for a particular use (ie meat substitute, savoury or sweet snack) should be construed as meaning a composition which is in fact suitable for the stated use (PCT Guidelines C-III 4.8). It is considered that the compositions described in the cited prior art documents D5 and D7 are suitable for said use.

4 Concerning the question whether the subject-matter of the present application meets the requirements of inventive step (Article 33(3) PCT), it is stressed that cited prior art documents D5 and D7 are also related to the preparation of protein concentrates based on milk proteins, employing hydrocolloids such as alginate, divalent cations and phosphates. Hence, the skilled person would have consulted them in order to solve the technical problem.

5 Dependent claims 2-21 do not appear to contain any features which, in combination with the features of the independent claims to which they refer, meet the requirements of novelty and inventive step (Articles 33(2) and 33(3) PCT). Furthermore, it is stressed that dependent claims are only allowable if appended to (a) patentable independent claim(s) (Rule 6.4 PCT).

CLAIMS

1. Method for the preparation of a meat substitute product which comprises protein, wherein:

1) a protein material, a hydrocolloid which precipitates with metal cations and water are added to one another,

2) the composition from step 1) is formed into a homogenous mixture,

3) the mixture from 2) is mixed with a solution of a metal cation with a valency of at least 2, in order to form a fibrous product,

4) the fibrous product is isolated,

characterized in that

5) the protein material comprises a milk protein material, and

6) the mixture of milk protein material, hydrocolloid which precipitates with metal cations and water is formed in the presence of an amount of a phosphate material wherein

~~3. Method according to claim 1 or 2, characterized in that~~ the milk protein material is selected from

- curd from cheesemaking
- cheese
- powdered milk
- whey protein
- alkali metal, alkaline-earth metal and ammonium caseinate.

or mixtures of two or more of these materials

2. Method according to claim 1, characterized in that first of all a mixture of the protein material and water is made, the phosphate material is added to this mixture and then the hydrocolloid which precipitates with metal cations is introduced.

3 ~~4.~~ Method according to one or more of claims 1 - ~~3~~, 2 characterized in that the phosphate material is selected from alkali metal and ammonium salts of phosphoric acid or polyphosphoric acid.

4 ~~5.~~ Method according to claim 3 ~~4~~, characterized in that the

phosphate material is selected from disodium hydrogen phosphate, sodium hexametaphosphate and trisodium phosphate.

5 ~~6.~~ Method according to claim ~~4~~ 3, characterized in that the phosphate material is sodium polyphosphate $(NaPO_3)_n$, where n ~ 25.

6 ~~7.~~ Method according to one or more of claims 1 - ~~6~~ 5, characterized in that the amount of phosphate material is at least sufficient to form a complex with free calcium ions which are present.

7 ~~8.~~ Method according to claim ~~7~~ 6, characterized in that the amount of phosphate material is 0.1 - 1.5% by weight, based on the total of all the constituents of the homogenous mixture.

8 ~~9.~~ Method according to one or more of the preceding claims, characterized in that the hydrocolloid which precipitates with metal cations is present in an amount of 0.1 - 10% by weight, based on the total of all the constituents of the homogenous mixture.

9 ~~10.~~ Method according to claim ~~9~~ 8, characterized in that the hydrocolloid which precipitates with metal cations is sodium alginate.

10 ~~11.~~ Method according to one or more of the preceding claims, characterized in that the pH of the homogenous mixture of protein, hydrocolloid which precipitates with metal cations, phosphate material and water is set to a value in the range from 4 - 7.

11 ~~12.~~ Method according to claim ~~11~~ 10, characterized in that to prepare a product with a meat-type structure starting from milk protein material, the pH is set to a value between 5.0 and 7.0.

12 ~~13.~~ Method according to claim ~~11~~ 10, characterized in that to prepare a product with a fish-type structure starting from milk protein material, the pH is set to a value between 4.5 and 6.0.

13

~~14.~~ Method according to one or more of the preceding claims, characterized in that a finishing material selected from flavouring, colouring and vegetable or animal fat, vegetable or animal protein and/or mixtures of two or more such materials is added to the homogenous mixture which has been formed.

14 ~~15.~~ Method according to one or more of claims 1 - 13 ~~14~~, characterized in that

to form a fibrous product starting from cheese curd:

- identical quantities by weight of cheese curd and water at approximately 50°C are mixed (total weight 2A) in the presence of 0.8 - 1.2% by weight, based on 2A, of sodium polyphosphate,
- 2.5 - 3.5% by weight, based on 2A, of sodium alginate, as well as water at approximately 50°C in an amount by weight A, are added with stirring,
- the homogenous mixture formed is mixed with stirring with a 3 - 5% by weight strength $CaCl_2$ solution in an amount by weight A to form a fibrous product,
- the fibrous product formed is isolated and finished.

15 ~~16.~~ Method according to one or more of claims 1 - 13 ~~14~~, characterized in that

to form a fibrous product starting from cheese:

- identical quantities by weight of grated cheese and water at approximately 50°C are mixed (total weight of 2B) in the presence of 0.8 - 1.2% by weight, based on 2B, of sodium polyphosphate,
- 2.5 - 3.5% by weight, based on 2B, of sodium alginate, as well as water at approximately 50°C in an amount by weight B, are added with stirring,
- the homogenous mixture formed is mixed with stirring with a 3 - 5% by weight strength $CaCl_2$ solution in an amount by weight B to form a fibrous product,
- the fibrous product formed is isolated and finished.

16 ~~17.~~ Method according to one or more of claims 1 - 13 ~~14~~, characterized in that

to form a fibrous product starting from sodium caseinate:

- a 10 - 15% strength by weight solution of sodium caseinate in water at approximately 50°C is made (total weight C) in the presence of 0.2 - 0.4% by weight of sodium polyphosphate, based on C,
- butter is added in an amount of 15 - 20% by weight, based on C,
- 3 - 5% by weight, based on C, of sodium alginate, as well as water at approximately 50°C in an amount by weight of 80 - 95% by weight, based on C are added with stirring,
- the homogenous mixture formed is mixed with stirring with 3 - 5% strength by weight calcium chloride solution in an amount of 80 -95% by weight, based on C, to form a fibrous product, and
- the fibrous product formed is isolated and finished.

17 ~~18.~~ Method according to one or more of the preceding claims 1 - 13 ~~14~~, characterized in that
to form a fibrous product starting from whey protein,

- a 15 - 20% strength by weight solution of whey protein in water at approximately 50°C is made (total weight D) in the presence of 0.2 - 0.4% by weight of sodium polyphosphate, based on D,
- butter is added in an amount of 12 - 18% by weight, based on D,
- 3 - 7% by weight, based on D, of sodium alginate, as well as water at approximately 50°C in an amount of 80 - 85% by weight, based on D, are added with stirring, and
- the homogenous mixture formed is mixed with stirring with 3 - 5% strength by weight calcium chloride solution in an amount of 80 - 85% by weight, based on D to form a fibrous product,
- the fibrous product formed is isolated and finished.

18 ~~19.~~ Method according to one or more of the claims 1 - 13 ~~14~~, characterized in that
to form a fibrous product starting from powdered milk:

- a 25 - 35% strength by weight solution of skimmed milk powder in water (total weight E) is made in the presence of 0.5 - 1.0% by weight, based on E, of sodium polyphosphate,
- butter is added in an amount of 11 - 15% by weight, based on E,

- 4 - 6% by weight, based on E, of sodium alginate, as well as water at approximately 50% C in an amount by weight of 65 - 75%, based on E, are added with stirring,
- the homogenous mixture formed is mixed with stirring with a 3 - 5% strength by weight $CaCl_2$ solution in an amount by weight of 65 - 75%, based on E, to form a fibrous product,
- the fibrous product formed is isolated and finished.

19 13
~~20.~~ Method according to one or more of claims 1 - ~~14,~~ characterized in that the protein material is milk protein material selected from powdered milk, whey protein and ~~caseinate,~~ alkali-metal or ammonium caseinate, and the method is carried out in the absence of a phosphate material.

20 19
~~21.~~ Method according to one or more of claims 1 - ~~20,~~ characterized in that the fibrous product, after it has been formed and isolated, is pasteurized in order to be finished.

21 20
~~22.~~ Method according to one or more of claims 1 - ~~21,~~ characterized in that the fibrous product is packaged.

22
~~23.~~ Meat substitute product obtained using the method according to one or more of claims 1 - ~~21.~~ 20

23
~~24.~~ Savoury or sweet snack obtained by processing a fibrous product formed with the aid of the method according to one or more of claims 1 - ~~21.~~ 20

24 ~~25.~~ Ready to consume meat substitute product obtained by culinary processing of a product according to claim ~~23.~~ 22